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range on the north and connects the upper valleys of Chulitna and Susitna rivers. Nenana River, a tributary of the Tanana, occupies the eastern part of the region. The valley of Jack River, which crosses Broad Pass just above the narrow valley of the Nenana, before that stream passes through the Alaska range, provides the route by which the railroad will cross from the Susitna-Chulitna drainage basin to that of the Tanana. The upper parts of streams tributary to Chulitna and Jack rivers overlap each other within Broad Pass, there being no appreciable divide between, so that the grades from the head of the Chulitna to the head of the Susitna are gentle and there is no obstruction. North and south of Broad Pass are high mountains. Those on the north are part of the great range from which, only 70 miles to the west, rise Mount McKinley and, nearby on the east, Cathedral Mountain and Mount Hayes. There is a fair growth of timber in the larger valleys but most of the country is above timber line. This region has long been a favorite hunting ground for the Indians of the Susitna valley. The geologic conditions in the region appear to be favorable to mineralization, but no valuable ore bodies have yet been discovered. The most favorable reports come from the district just west of Broad Pass, near the head of Chulitna River, an important gold placer district, where prospecting has been carried on for several years. Valdez Creek lies about thirty miles east of the pass. Along some of the streams between Broad Pass and Valdez Creek there are prospects of placer gold, which, however, has not been found in commercial quantity. Copper prospects, too, have been discovered in several parts of the region, and at one place, Coal Creek, there is a small area of coal. The railroad, which will probably soon reach this region, will aid greatly in its development. The wealth of the Broad Pass region appears to be mineral rather than agricultural, and it can be profitably exploited only by a greater population and through better means of transportation.

AT the meeting of the Royal Society on November 11 Sir Ronald Ross read an intro-

ductory paper on "Pathometry." According to an abstract the method he proposed to follow in studying the nature of the functions according to which the number of individuals infected with some disease should vary from time to time, on the supposition that the laws governing the rate of transference of the considered disease were already known *a priori*. He stated the fundamental problem under consideration in the following terms: "If a population is divided into two groups, namely, those who are affected by some kind of happening, such as an infectious disease, and those who are not so affected; and if in unit of time a constant or variable proportion of the non-affected become affected, while simultaneously a constant proportion of the affected become non-affected (that is, revert or recover); and if at the same time both the affected and the non-affected are subject to different birth-rates, death-rates and rates of immigration and of emigration, so that the whole population may be incessantly varying during the period under consideration; then what will be the number of affected individuals and also the number of new cases at any moment during that period?" In this first paper the problem was presented in mathematical language, with its solution, and a broad analysis of the curves obtained and of some integrals. Only constant rates of happening (applicable to other happenings besides disease), and rates which varied according to the number of individuals already affected (specially applicable to infectious diseases) were considered. In the latter cases the resulting curves were frequently bell-shaped, declining a little more slowly than they rose—that is, generally similar to the curves frequently seen in epidemics—thus suggesting *prima facie* that epidemics might be largely explicable in the terms of the thesis given.

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#### UNIVERSITY AND EDUCATIONAL NEWS

THE General Education Board announces appropriations to colleges as follows: Maryville College, Maryville, Tennessee, \$75,000 toward an endowment fund of \$300,000; West-

ern College for Women, Oxford, \$100,000 toward an endowment fund of \$500,000; Milwaukee-Downer College for Women, Milwaukee, Wisconsin, \$100,000 toward an endowment fund of \$500,000. Including the foregoing, the General Education Board has since its organization thirteen years ago appropriated to colleges \$12,322,460 toward a total sum of \$57,375,525 to be raised.

THE board of trustees of the Carnegie Institute, Pittsburgh, announce the gift of \$250,000 from the Carnegie corporation of New York, the money to be used for the purchase of ground north of the present campus.

THE formal opening of Alden Hall of Biology of Allegheny College took place on February 4. Dr. W. J. Holland, director of the Carnegie Museum of Pittsburgh, gave the principal address on "Biology, a Cultural and Practical Study." The building is 60 feet by 120 feet, built of gray vitrified brick and terra cotta, with a Spanish tile roof, and is well equipped throughout. Professor C. A. Darling is in charge of the department.

IT is stated in *Nature* that the number of undergraduates in residence at Cambridge this term is 665, as against 1,227 during the corresponding term last year, and about 3,600 in a normal term. Amongst the 11,000 members of the university in the land, sea and air services, 1,723 casualties have been notified; 697 have been killed and 892 wounded.

THE Berlin correspondent of the *Journal of the American Medical Association* writes that during the semester preceding the opening of the war, 79,077 students (of whom 4,500 were women and about 9,000 foreigners) attended the fifty-two universities and other higher institutions of the German Empire. Of this number 60,943 (4,117 women, 4,100 foreigners) were enrolled in the twenty-one universities; 12,232 (82 women, 2,500 foreigners) were enrolled in the eleven technical schools. The six schools of commerce (Berlin, Cologne, Frankfort, Leipzig, Mannheim and Munich) had 2,625 students, and the four veterinary colleges (Berlin, Dresden, Hanover and Munich) had 1,404 students. The three agricultural

colleges had 938 students. Three schools of mining had 668 students, and 267 students were registered in the four schools of forestry. During the first semester following the beginning of the war, the total number of matriculants fell to 64,700 in forty-seven of these institutions. The four schools of forestry were closed, and the veterinary school in Munich became a part of the university. During the winter of 1914-15, about 50,000 of these students were in the field or available for service; that is, 75.75 per cent. of the 66,000 German male students registered at the beginning of the war. Of the 66,000 German male students who were registered at the end of the summer of 1915, only 12,000 are still in attendance at the schools so that about 54,000, or 81.81 per cent., of German higher students are now enrolled in the army. Of the 13,785 university students registered during the summer semester of 1870, only 4,400 (32 per cent.) were at the front, and 3,200 of this number fell in the field.

DR. HOWARD E. PULLING has been appointed to an instructorship in plant physiology in the Johns Hopkins University for the current year.

DR. ROBERT LEWIS, assistant biochemist at the United States Pellagra Hospital, Spartanburg, S. C., has been elected professor of physiology in the University of Colorado.

## DISCUSSION AND CORRESPONDENCE

### ATMOSPHERIC TRANSMISSION

TO THE EDITOR OF SCIENCE: In SCIENCE for December 3, 1915, page 802, line 27, Mr. Very speaks as positively as ever of the diurnal variability of the transmission of the atmosphere and the incorrectness of neglecting its effect in reducing solar constant observations. Does the evidence to the contrary of the observations of September 20 and September 21, 1914, when the sun was observed at Mount Wilson from sun-rise to 10 o'clock, weigh nothing at all with him?<sup>1</sup>

Secondly. In his recent paper on "Earth-

<sup>1</sup> See "New Evidence on the Intensity of Solar Radiation Outside the Atmosphere," by Abbot, Fowle and Aldrich, Smithsonian Miscellaneous Collections, Volume 65, No. 4, 1915.